

N.S. SAVANNAH

Health Physics Manual

Prologue

This is a revision and reissue of the N/S SAVANNAH Health Physics Manual dated 1981. This revision is promulgated to support the radiological and environmental characterization contract undertaken by WPI, Inc., in February 2005. The conditions and permissives contained herein shall continue in effect until superseded or revoked. The Senior Technical Advisor, N.S. SAVANNAH (MAR-610.4) is responsible for this manual.

Record of Revisions

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REFERENCES

- Title 10, Code of Federal Regulations, Part 20*
- Table I of NRC Reg. Guide 1.86*

A. GENERAL INFORMATION

1. Introduction

This Health Physics Manual describes the policies, instructions, and procedures which apply to the radiation protection program for the N/S SAVANNAH in its current decommissioned state. The information contained in this Manual is in accordance with applicable sections of *Title 10, Code of Federal Regulations, Part 20*, and the Technical Specifications of the *Nuclear Regulatory Commission Facility License NS-1*, as amended.

2. Status of Vessel

The Nuclear Ship SAVANNAH is in a state of protective storage. The vessel is currently moored in the James River Reserve Fleet (JRRF) near Fort Eustis, Virginia. The US Army Nuclear Barge STURGIS is moored tight alongside the N/S SAVANNAH. The facility is not open to the public.

The current status of the nuclear power plant is as follows:

Fuel	All fuel elements have been removed.
Control Rods and CRDMs	All 21 CRDs disconnected and shafts withdrawn.
Main Coolant Pumps	All four pumps removed.
Pump Volutes	Blanked-off
Reactor Vessel	Closed with head in place
Primary Water	Removed*
Secondary Water	Removed
Resin Tanks	Removed
Fission Chambers and Start-up Source	Removed
Loose Radioactive Components	Removed
Major Contaminated Waste	Removed

In addition the Main Engine Bull Gear was removed from the ship in 1980.

* There may be approximately 1100 gallons of water in the non-drainable reactor vessel bottom head

3. Responsibility

The N/S SAVANNAH License (docket # 50-238 and Facility License NS-1) is presently administered by the Senior Technical Advisor, Office of Ship Operations, MAR-610.4, Maritime Administration, U.S. Department of Transportation, 400 7th Street, S.W., Washington, DC 20590-0001.

A qualified health physicist serves as the Radiation Safety Officer (RSO) for the licensee and carries out the radiation safety program. The qualifications for the health physicist is that person shall have two years specialized training in health physics or equivalent and three years of work experience related to radiological health and safety.

4. Radiation Safety Officer

There shall be a health physicist who meets all of the above qualifications designated as Radiation Safety Officer. The Radiation Safety Officer may be a consultant or contractor. The Radiation Safety Officer function may be delegated for specific activities as long as the Radiation Safety Officer qualifications meet the requirements identified in Section A.3, Responsibility.

5. Health Physics Records and Logs

The Radiation Safety Officer shall be responsible for maintaining health physics records and logs as described in Section H of this manual. In a incident requiring the activation of the SAVANNAH Emergency Radiological Assistance Team (SERAT), the health physicist for that effort is responsible for maintaining health physics records for SERAT members. These records and logs shall be kept aboard the vessel or in the control of the Senior Technical Advisor and available for inspection by the Nuclear Regulatory Commission.

B. CONTROL AREAS

1. Definition

Control Areas aboard the N/S SAVANNAH, under the present technical specifications, are defined as those compartments, spaces or areas which contain radioactive material, residual radioactivity, or radioactive contamination.

2. Classes of Control Areas

- a) Radiation Area. Areas where the radiation levels are such that a major portion of the body could receive, in any one hour, a dose of 5 mrem, or in any five consecutive days a dose in excess of 100 mrem.
- b) High Radiation Area. Areas wherein the radiation levels are such that a major portion of the body could receive, in any one hour, a dose in excess of 100 mrem.
- c) Airborne Radioactivity Area. Areas wherein the airborne radioactivity is in excess of the amount specified in *Appendix B, Table 1 of 10 CFR 20*.
- d) Radioactive Materials Area. Area in which radioactive material is used or stored and which contains radioactive material.
- e) Contaminated Area. Compartments, spaces, machinery, components in which removable surface contamination is greater than 1000 disintegrations per minute (dpm)/100 cm² for beta-gamma emitters.
- f) High Contamination Area. Compartments, spaces, machinery, components where removable contamination levels are 100 times greater than that for a contamination area (100,000 dpm/100 cm² for beta-gamma emitters).

3. Security of Control Areas

All Control Areas will be posted, locked and sealed when access is not required. When access is required, a Radiation Work Permit will be required to enter the area or continual health physics coverage is required.

4. Access Control

Access into a Control Area shall be controlled by procedures outlined in Section F of this Manual.

5. Radiation Caution Signs

Each access point into a Control Area shall be posted with the appropriate Radiation Caution Sign in accordance with 10 CFR 20.

6. Radiological Criteria for Unrestricted Areas

Note – No change to the radiological criteria has been made since the N/S SAVANNAH was removed from public display. Therefore, this section has not been changed.

All areas accessible to the general public and employees shall have radiation levels of less than 5 uR/hr above natural background as measured at one meter from any surface. All surfaces shall be decontaminated and maintained at levels less than those prescribed in *Table I of NRC Reg. Guide 1.86*. Prior to an area being opened for unrestricted access, the licensee shall survey the area for radiation levels with appropriate portable instrumentation and make a contamination survey of the area in accordance with established health physics procedures and as provided for in *Table I of NRC Reg. Guide 1.86*.

All areas of the vessel identified as restricted access to only employees and staff shall have direct radiation levels of less than 5 uR/hr above natural background as measured at one meter from any surface and contamination levels less than prescribed in *Table I of NRC Reg. Guide 1.86*. For those restricted areas with radiation and contamination levels in excess of these limits, entry shall be made in accordance with the licensee's procedures set forth in this manual.

7. Spaces Designated Control Areas

a) "A" Deck.....Health Physics Laboratory

SECURITY:	Compartment locked
MONITORING DEVICES REQUIRED:	No
PROTECTIVE CLOTHING REQUIRED:	No

b) "B" Deck.....Reactor Space, Upper Secondary Containment

SECURITY:	Locked and Sealed
MONITORING DEVICES REQUIRED:	Yes
PROTECTIVE CLOTHING REQUIRED:	Yes

c) "B" Deck.....Fan Room, Above Forward Control, Starboard Side

SECURITY:	Locked and Sealed
MONITORING DEVICES REQUIRED:	Yes
PROTECTIVE CLOTHING REQUIRED:	No

- d) "C" Deck Reactor Space, Lower Secondary Containment

SECURITY: Locked and Sealed
MONITORING DEVICES REQUIRED: Yes
PROTECTIVE CLOTHING REQUIRED: Yes

- e) Primary Reactor Containment Vessel (inside Reactor Space Compartment)

SECURITY: Hatches Sealed
Primary Containment shall not to be entered except as directed by the Senior Technical Advisor, MAR-610.4 or as required to support the N/S SAVANNAH Characterization effort being performed by WPI. This effort includes a tour for potential decommissioning contractors. Primary Containment must be ventilated prior to entry.

- f) "C" Deck Forward Control-Cold Water Chem Lab & Rad Monitoring Room

SECURITY: Locked and Sealed
MONITORING DEVICES REQUIRED: Yes
PROTECTIVE CLOTHING REQUIRED: Yes

- g) "D" Deck Forward Control-Rad Sampling Room & Gas Adsorp Equip Room

SECURITY: Locked and Sealed
MONITORING DEVICES REQUIRED: Yes
PROTECTIVE CLOTHING REQUIRED: Yes

- h) 14' - 0" Flat Port and Starboard Stabilizer Room

SECURITY: Locked and Sealed
MONITORING DEVICES REQUIRED: Yes
PROTECTIVE CLOTHING REQUIRED: Yes

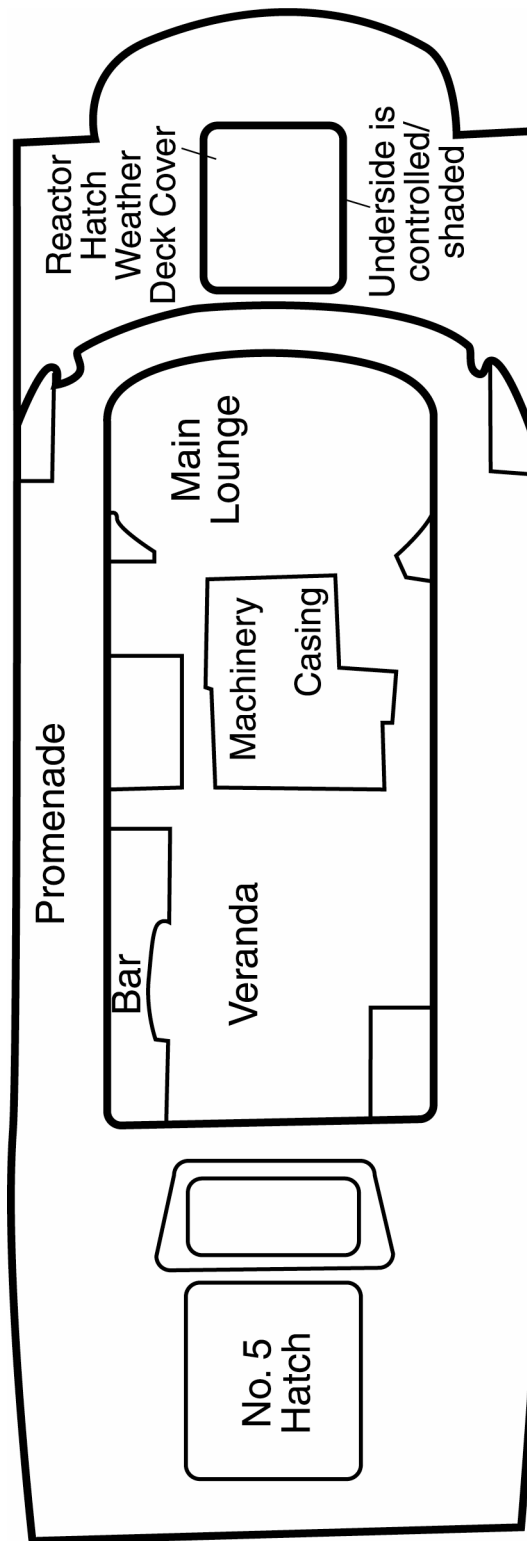
- i) Machinery Space Hot Chemistry Lab

SECURITY: Locked and Sealed
MONITORING DEVICES REQUIRED: Yes
PROTECTIVE CLOTHING REQUIRED: No

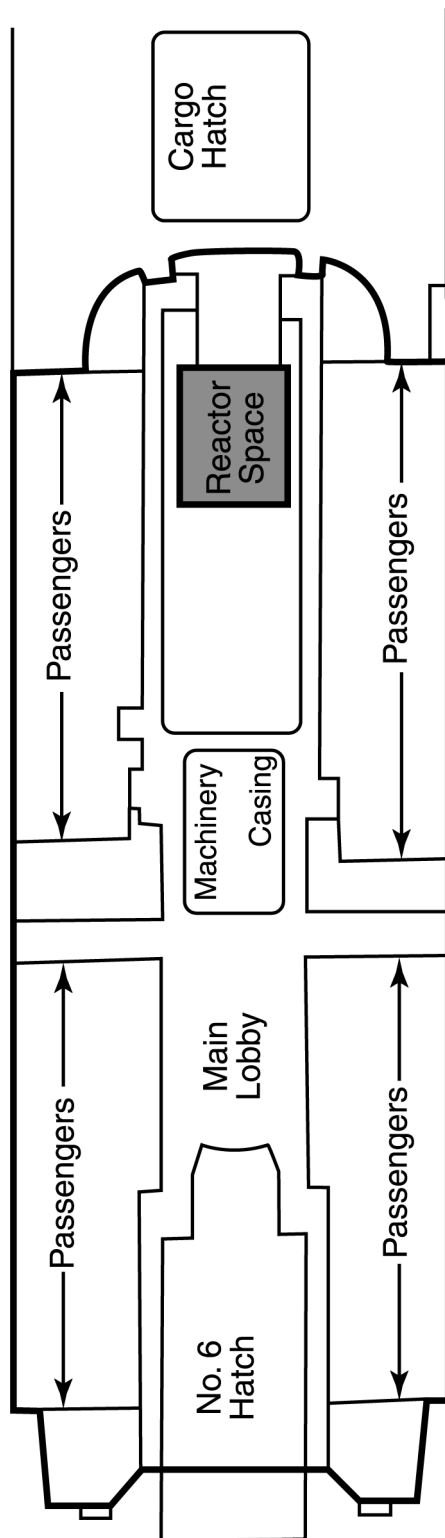
- j) Machinery Space Port and Starboard Charge Pump Rooms

SECURITY: Locked and Sealed
MONITORING DEVICES REQUIRED: Yes
PROTECTIVE CLOTHING REQUIRED: Yes

Drawing B-1 – Promenade Deck Control Areas (shaded)

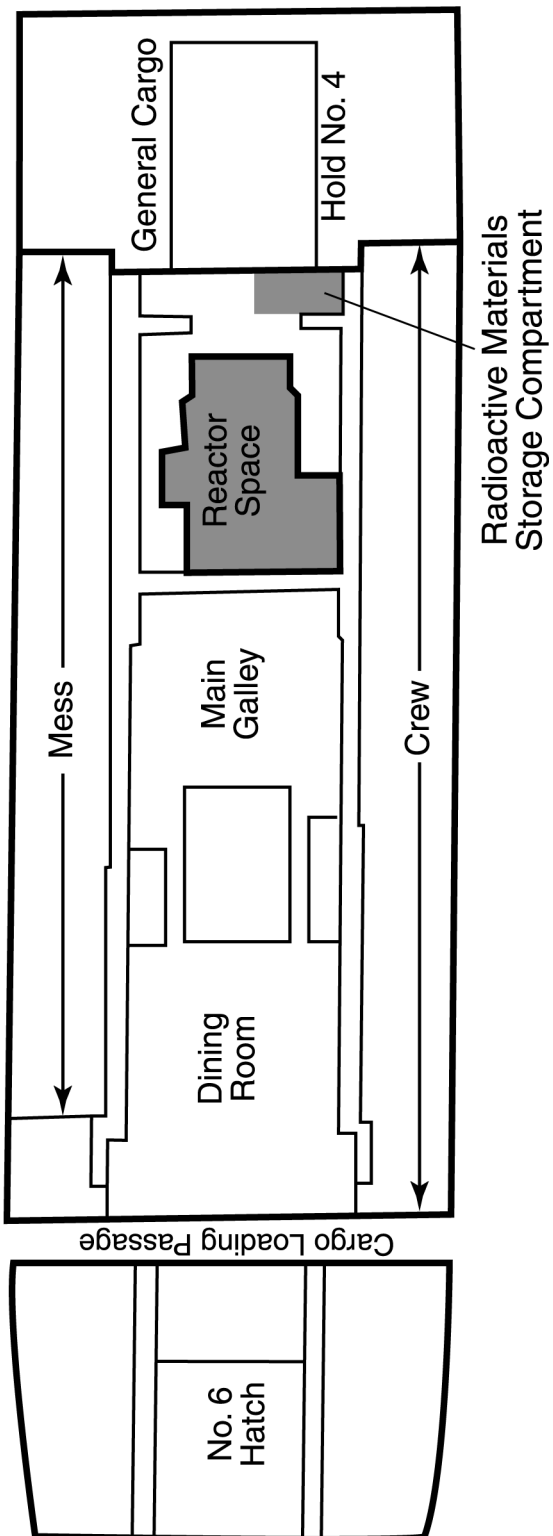


Drawing B-2 – A Deck Control Areas (shaded)

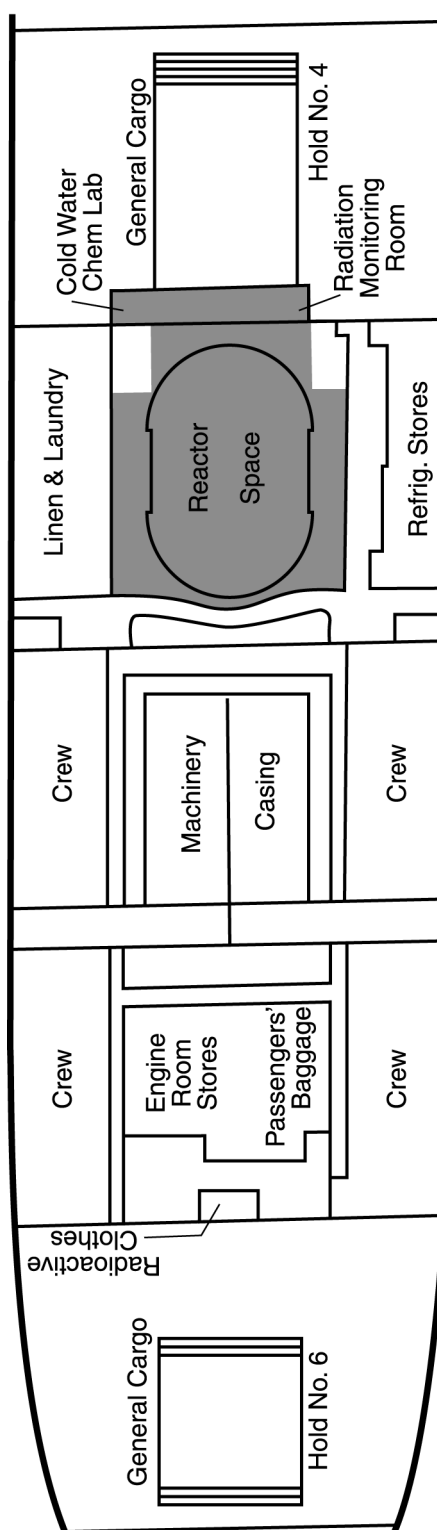


----- Frame 113

Drawing B-3 – B Deck Control Areas (shaded)

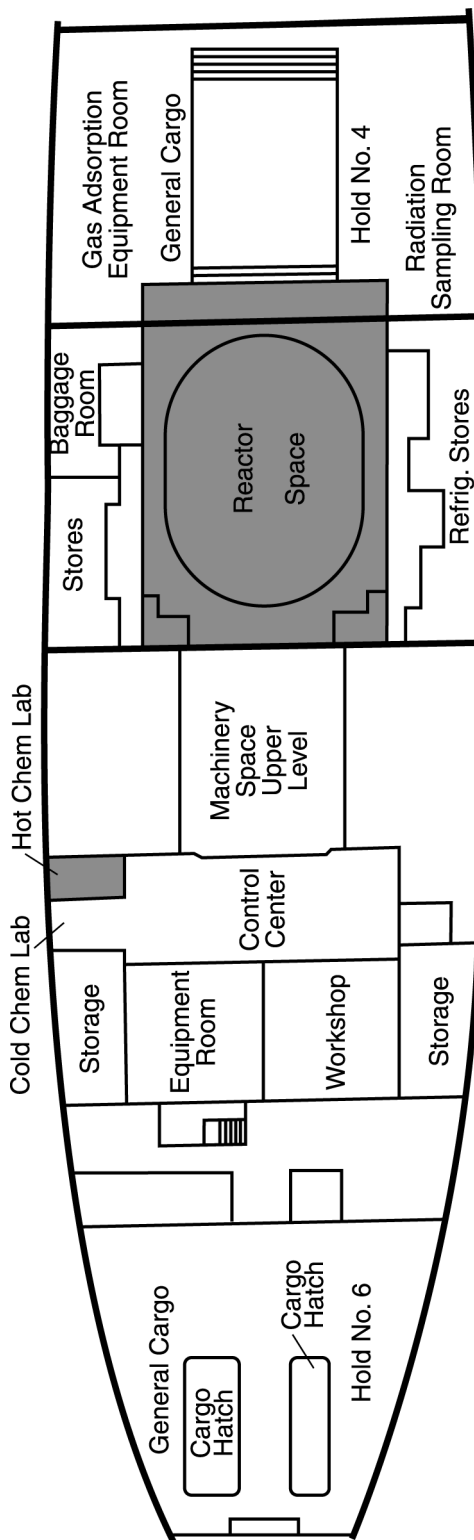


Drawing B-4 – C Deck Control Areas (shaded)



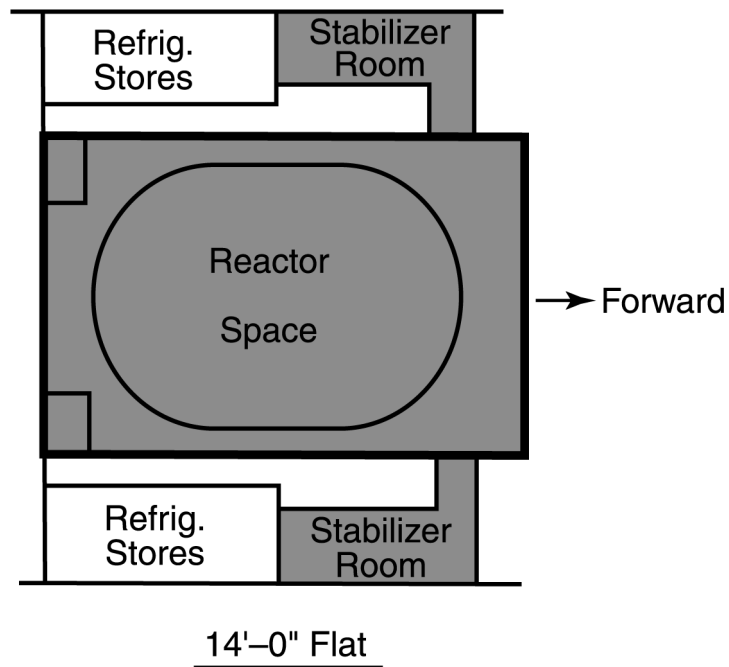
----- Frame 113

Drawing B-5 – D Deck Control Areas (shaded)

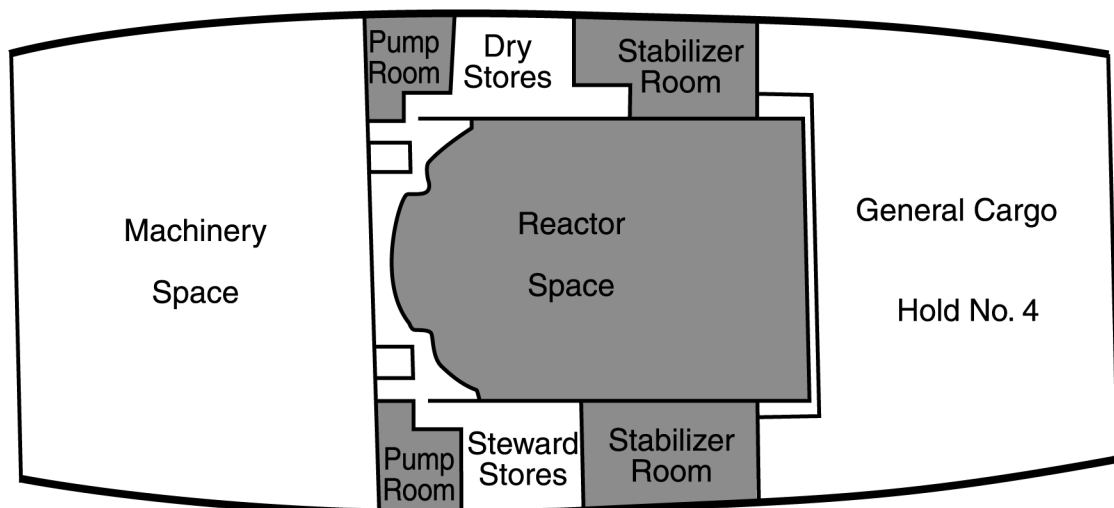


----- Frame 113

Drawing B-6 – 14' - 0" Flat Control Areas (shaded)



Drawing B-7 – Charge Pump and Stabilizer Room Control Areas (shaded)



C. PERSONNEL MONITORING

1. Purpose

The purpose of personnel radiation monitoring is to assure that no individual receives exposure to ionizing radiation above the limits set forth in *10 CFR Part 20* and that all exposure to individuals shall be kept as low as reasonably achievable (ALARA).

2. Monitoring Methods

Personnel monitoring shall be accomplished by one or several ways:

- a) Area Radiation Surveys – direct radiation measurements made with the proper portable survey instrument to determine radiation levels and stay time.
- b) TLD BADGES or Electronic Dosimeter – each individual entering a Radiation Control Area shall be provided with a TLD badge or an Electronic Dosimeter.

3. Contamination Surveys

Each individual exiting a Radiation Control Area shall be monitored for radioactive contamination with the proper portable survey instrument.

4. Radiation Exposure Records

Records shall be maintained on all individuals utilizing any of the methods of personnel monitoring: calculated dose or TLD badges. The *Daily Personnel Exposure Record* (**Form C-1** in the Appendix) shall be completed each work day.

Review as to what we are using and change appropriately. If we are using Electronic dosimeters they should be added to section “2” and section “4” must be reworded.

Form C-1 – Daily Personnel Exposure Record (typical)

Form C-1	U.S. MARITIME ADMINISTRATION N/S SAVANNAH Daily Personnel Exposure Record				Date:
Name	SSN	Dosimeter No.	Start	End	Exposure
Location:			Work Period (hrs.):		
Remarks:					
Signed::			Date:		

D. INSTRUMENTATION**1. Shipboard Instrumentation and Monitoring Systems**

None of the shipboard radiation monitoring systems are operable. The laboratory counting equipment is of historical value only and not operable. For the characterization effort, laboratory counting equipment will be obtained as required.

2. Portable Survey Instruments

Radiation area surveys shall be performed with portable radiation detectors/counters designed to detect beta-gamma during routine radiation monitoring. Special instrumentation will be utilized for specific type surveys as required.

3. Thermoluminescent Dosimeters (TLD) or Electronic Dosimeters

TLD's or electronic dosimeters will be utilized for personnel monitoring.

4. Quality Control

Portable survey instruments will be re-calibrated annually or as specified by the manufacturer.

5. SERAT Instrumentation

Instrumentation needed to support the SERAT is identified in the SERAT Shipboard Emergency Response and Inspection Protocol for conditions at James River Reserve Fleet.

Form D-1 – Laboratory Analysis Report (typical)

Form D-1	U.S. MARITIME ADMINISTRATION N/S SAVANNAH Laboratory Analysis Report		Sheet No.
Sample ID #		Type Media:	
Laboratory Code:	Volume Collected:	Method:	
Date Collected:	Time:	Other:	
Laboratory Results:			

E. RADIATION SURVEYS AND SAMPLING

1. Routine Radiation Monitoring Stations

Routine Radiation Monitoring Stations have been defined aboard the vessel and shall be the basis for quarterly radiation area surveys. The locations of these monitoring stations are listed and indicated in drawings in this section.

2. Semi-annual Radiation Survey

Semi-annual radiation surveys of the ship will be made by the Radiation Safety Officer and/or qualified health physicist. Surveys will be made:

- a) In all uncontrolled areas of the ship (Routine Radiation Monitoring Stations)
- b) In the Lower Secondary area for radiation levels and water leakage
- c) In the Port and Starboard Stabilizer Rooms
- d) In the Forward Control Areas
- e) In the Charge Pump Rooms
- f) In the Hot Chem Lab, in the Control Room Area
- g) The accessible areas adjacent to the entries to the Controlled Areas will be surveyed.
- h) The primary containment vessel will remain closed and sealed unless otherwise authorized by the Senior Technical Advisor, MAR-610.4 or as required for the NS Characterization effort.

3. Sample Collection

Semi-annually, water samples and bottom sediment will be taken adjacent to the ship and analyzed by a qualified laboratory for radioactivity.

4. Direct Radiation Exposure Measurements

Thermoluminescent area dosimeters will be utilized to measure radiation exposure aboard the vessel.

List of Routine Radiation Monitoring Stations

NAVIGATION BRIDGE DECK

In Pilot House at helm
Bridge Wing, Port Side
Bridge Wing, Starboard Side
At Fire Station #1, near Chart Room
In Fan Room, Port Side, Emergency Generator Room

BOAT DECK

Chief Engineer's State Room, Port Side
Captain's State Room, Starboard Side
At Fire Station #2, Port Side Passageway
In Officer's Lounge, Aft

PROMENADE DECK

At Aux. Reactor Hatch and Ducts, Forward of Reactor Hatch
Port Side of Main Reactor Hatch
At Fire Station #5 near Starboard Side of Reactor Hatch
At Fire Station #4, Port Side Prom Deck
Center of Main Lounge
Center of Veranda
At Fire Station #7, Starboard Side Prom Deck

A DECK

At Fire Station #14, Port Passageway
Center of Main Lobby
At Fire Station #16, Port Passageway
At Fire Station #17, Starboard Passageway
At Fire Station #15, Starboard Passageway
Area outside Doctor's Office and Health Physics Lab

B DECK

At Fire Station #20, Port Passageway
At Fire Station #22, Port Passageway
Passageway outside Steward's Mess & Lounge, Port Side
Center of Main Dining Room
Center of Conference Room, Aft
At Fire Station #21, Starboard Side
Passageway outside Reactor Space water tight door, closed
Inside Main Galley

C DECK

Visitor's Gallery, Port Side
Visitor's Gallery, Mid-ship
Visitors Gallery, Starboard Side
Outside Forward Control door. Port Side

D DECK

At Reactor Control Center
Outside of Hot Chem Lab door, closed. Port Side
Engine Room Toilet Port Side
Upper Level, Engine Room, Port Side
Upper Level, Engine Room, Starboard Side

ENGINE ROOM - LOWER LEVEL

Outside Port Pump Room Hatch, closed
Outside Starboard Pump Room Hatch, closed
Lower Level, Engine Room, Port Side
Lower Level, Engine Room, Starboard Side

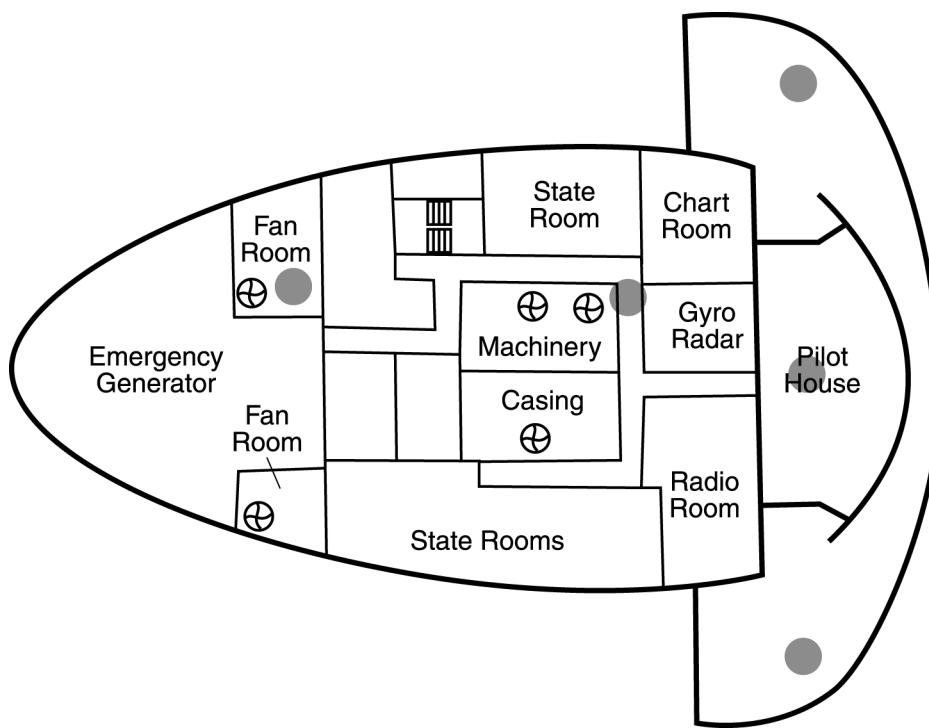
14' - 0" FLAT

Outside Port Stabilizer Room Hatch, closed
Outside Starboard Stabilizer Room Hatch, closed

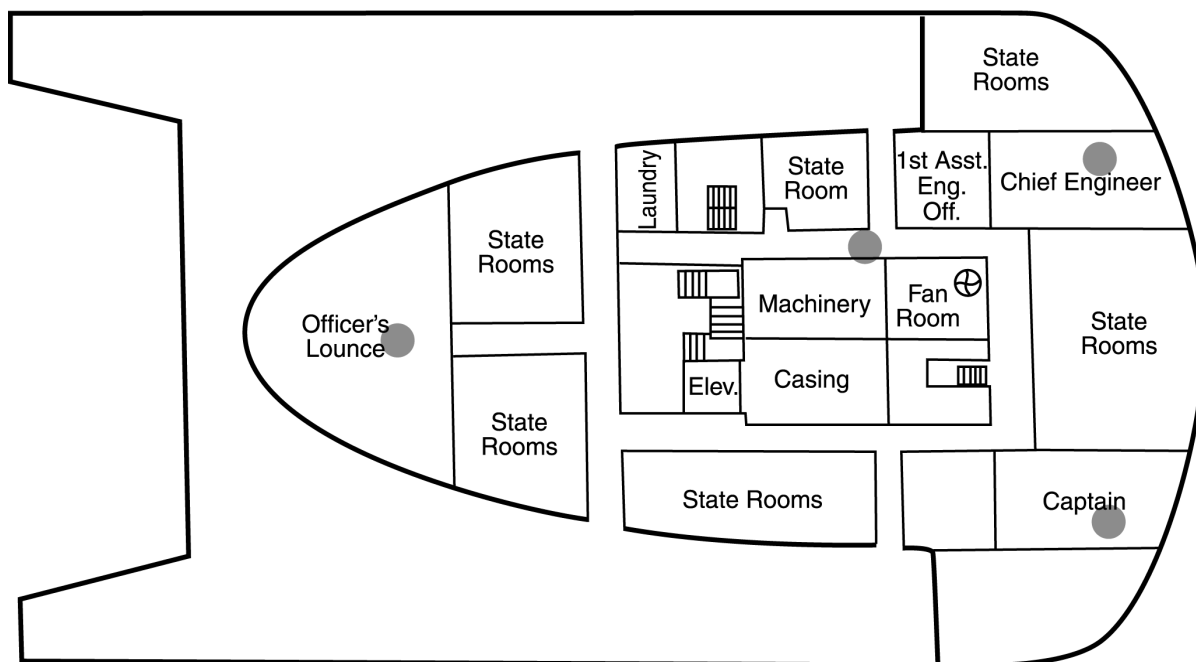
CARGO HOLD NO. 4

At Aft Bulkhead, "B" Deck Level (next to Forward Control space)
At Aft Bulkhead, "C" Deck Level (next to Forward Control space)

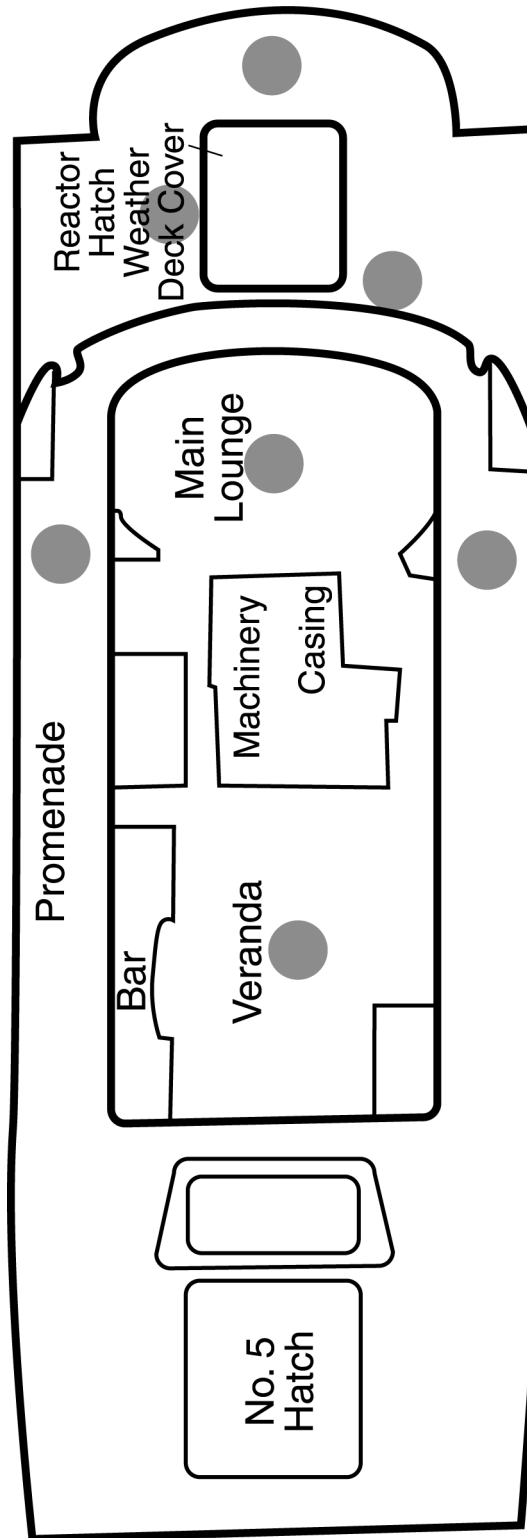
Drawing E-1 – Navigation Bridge Deck Monitoring Stations



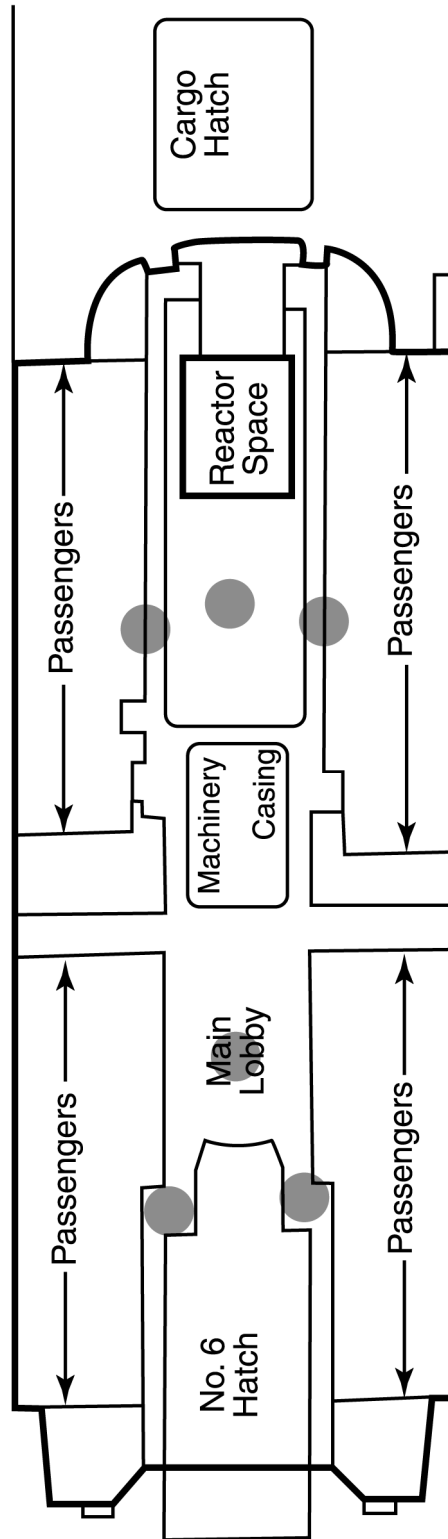
Drawing E-2 – Boat Deck Monitoring Stations



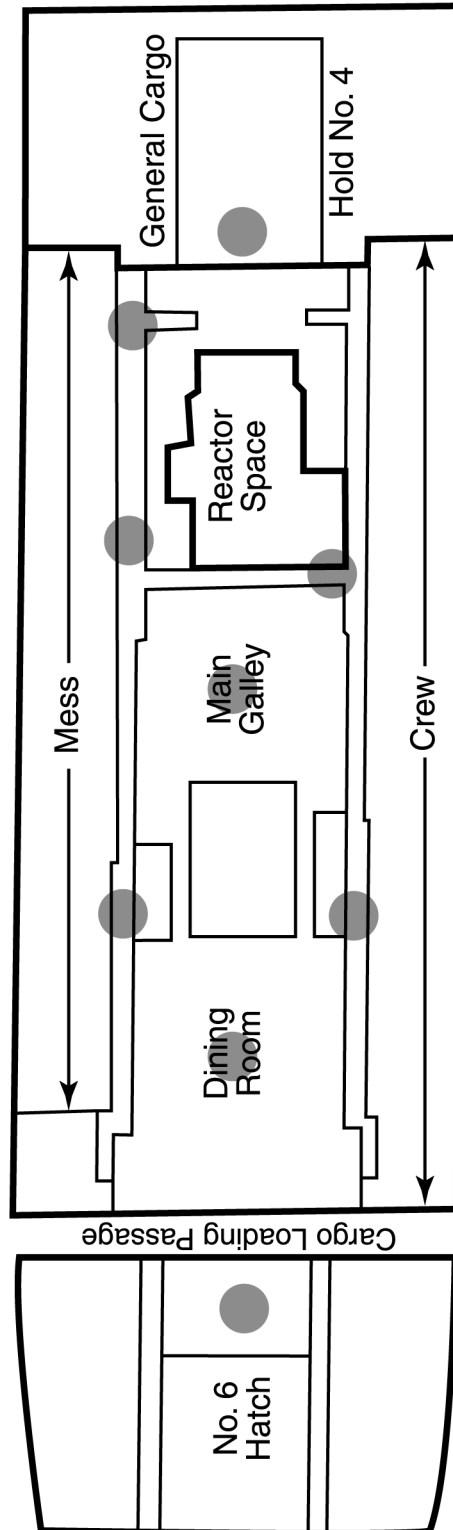
Drawing E-4 – Promenade Deck Monitoring Stations



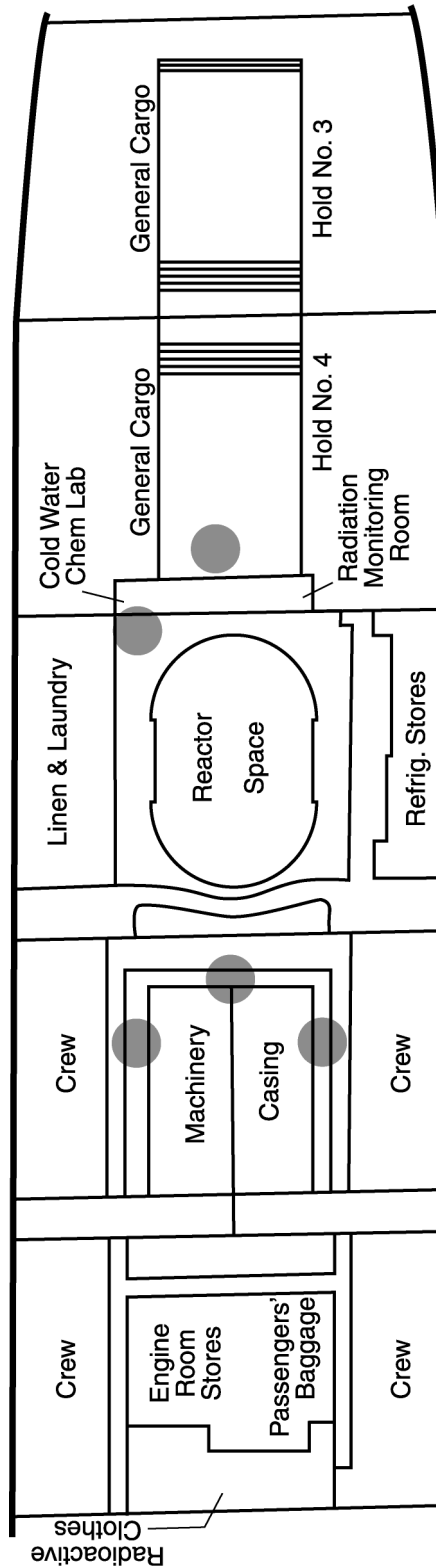
Drawing E-5 – A Deck Monitoring Stations



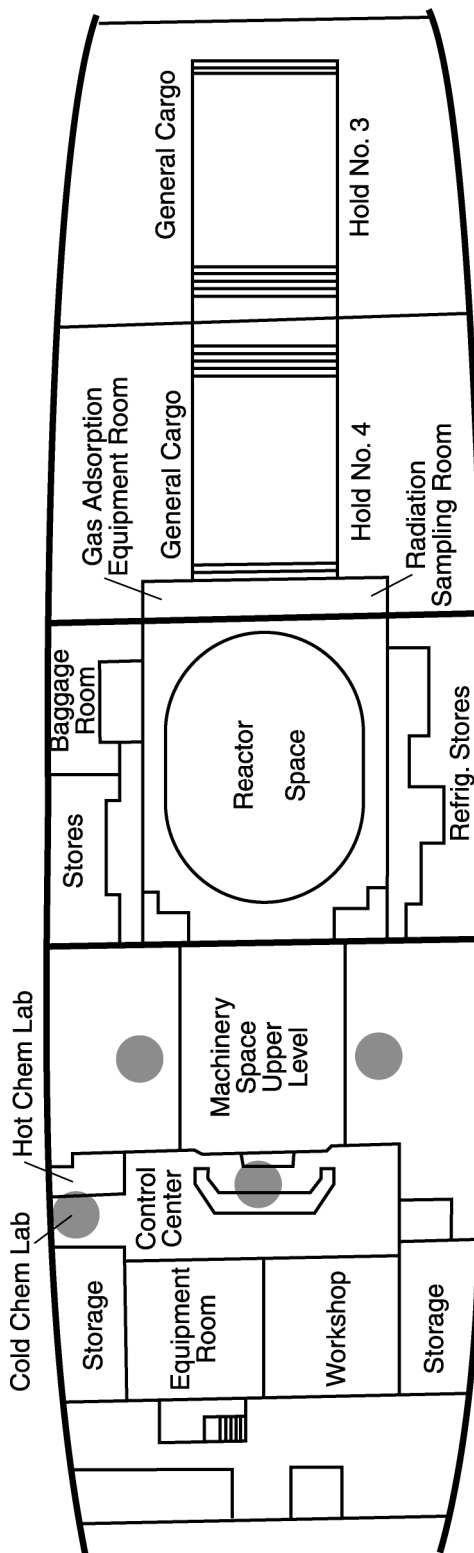
Drawing E-6 – B Deck Monitoring Stations



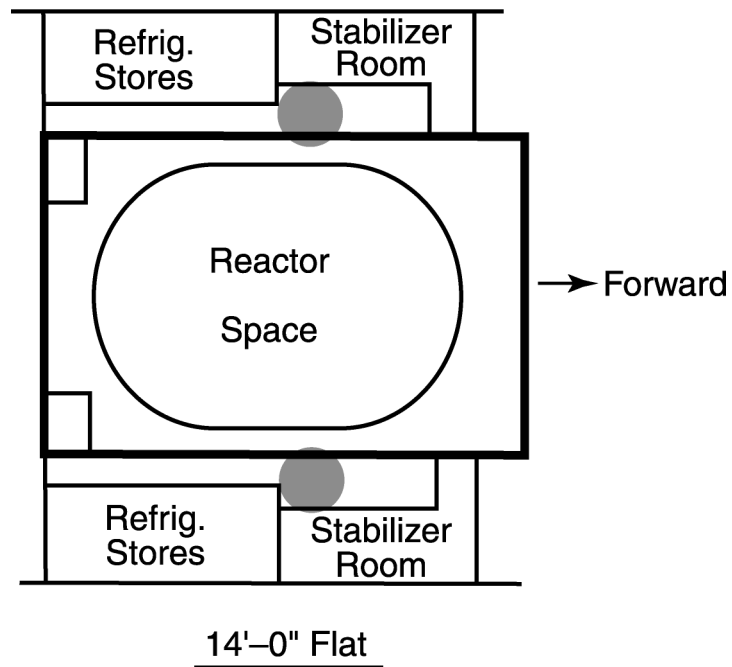
Drawing E-7 – C Deck Monitoring Stations



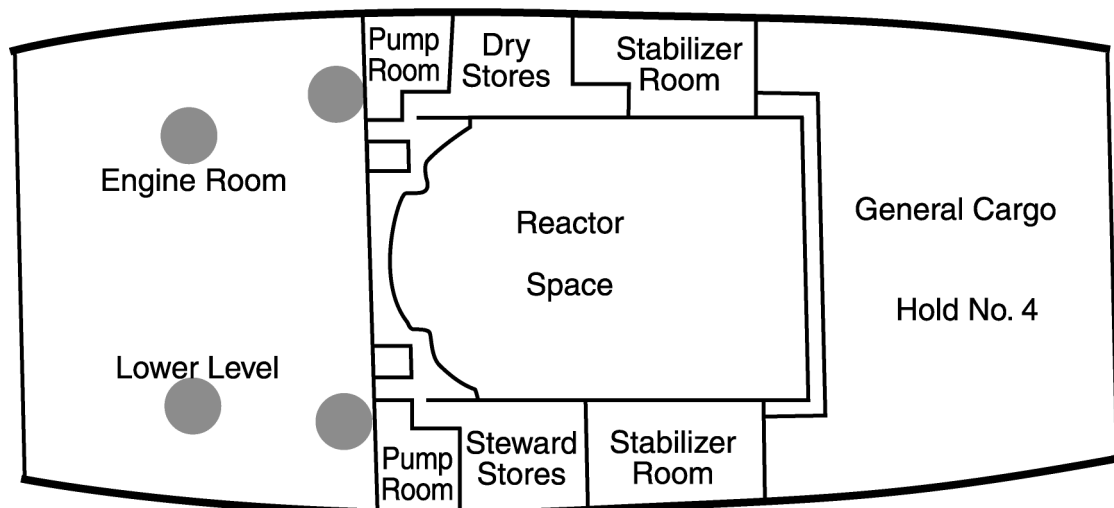
Drawing E-8 – D Deck Monitoring Stations



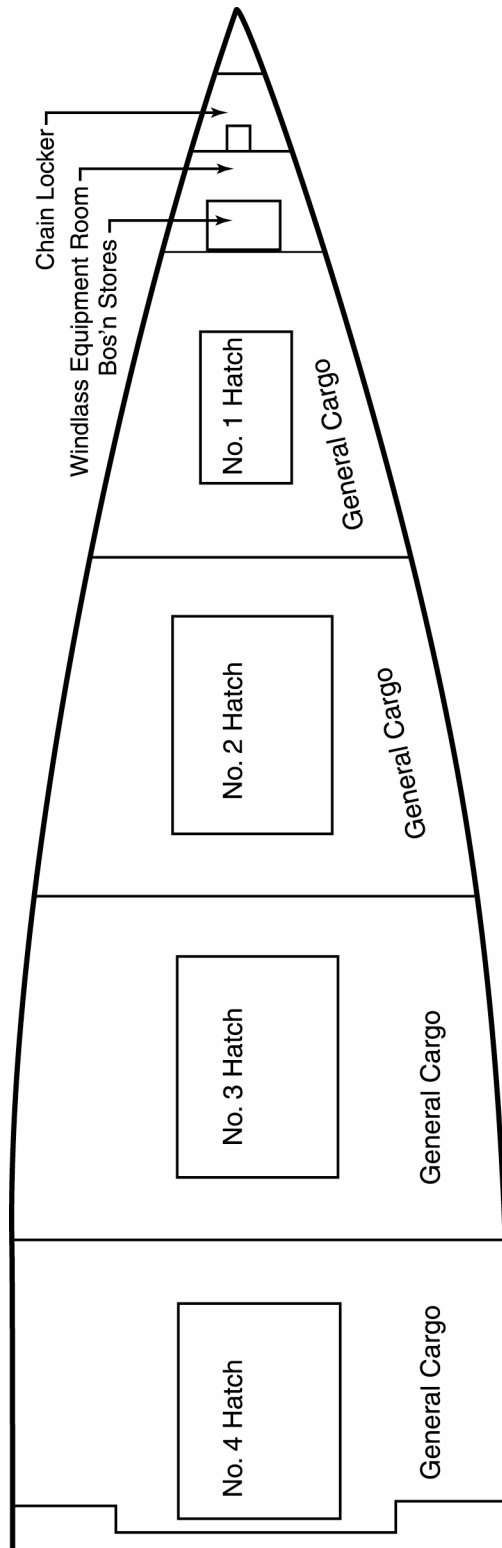
Drawing E-9 – 14' – 0" Flat Monitoring Stations



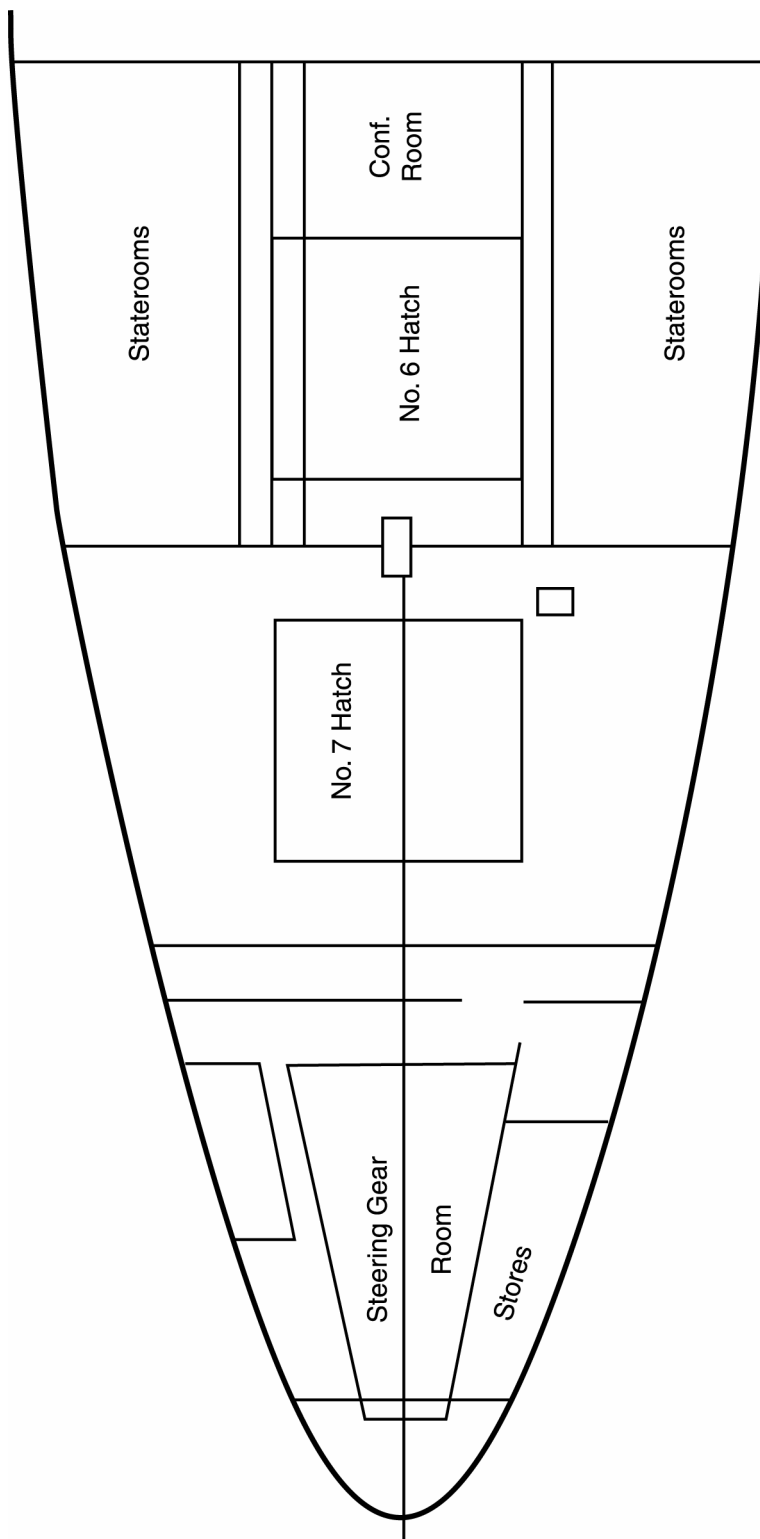
Drawing E-10 – Pump Room Monitoring Stations



Drawing E-11 – Forward Cargo Holds Monitoring Stations



Drawing E-12 – Rear Cargo Holds Monitoring Stations



F. RADIATION WORK REQUEST

1. Scope

A Radiation Work Request shall be obtained by all personnel prior to entering a Radiation Control Area or performing any work on radioactive or contaminated systems, material, or equipment.

In the event that the safety of the ship or personnel are endangered, entry may be made into a Control Area for an emergency situation as defined in the SERAT Shipboard Emergency Response and Inspection Protocol. The Radiation Safety Officer (RSO) shall be notified as soon as possible that an emergency entry into a Control Area has been necessary.

2. Work Authorization Request

- a) Form F-1 *Work Authorization Request*, shall be submitted to the Radiation Safety Officer (routine entries under normal conditions may be delegated) prior to entry into Radiation Control Areas. The authorized individual submitting the request shall complete all information as required in Sections A through F.
- b) The Radiation Safety Officer (routine entries under normal conditions may be delegated) will review the request and may consult with the individual making the request for additional information. When approved, the request will be signed by the RSO or designee and returned to the originator along with additional information and instructions as required and documented on Form F-2 *Entry Instruction and Requirements*.

3. Security of Control Areas

- a) Control Areas shall be returned to their secure condition immediately following the work.
- b) All Control Areas will be posted with radiation caution signs, locked and sealed with a numbered seal.
- c) A record shall be kept of seal numbers.

Form F-1 – Work Authorization Request (typical)

Form F-1	U.S. MARITIME ADMINISTRATION N/S SAVANNAH Work Authorization Request	Date:
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**REQUEST FOR WORK AUTHORIZATION
AND ENTRY INTO RADIATION CONTROL AREA**

To: RADIATION SAFETY OFFICER	From:
A. Compartment or space to be entered:	B. Date(s) to be entered:
B. Reason for entry (type work or inspection to be performed, etc):	
D. Material, equipment, machinery, parts, components, etc. to be removed:	
E. Number of personnel required to perform work or inspection:	
F. Identification of Person submitting request (name, title, phone, fax, email, etc.):	
Permission for Work Authorization and Entry is approved based on information submitted above, subject to the following conditions:	
Signature:	Date:

Form F-2 – Entry Instruction and Requirements (typical)

Form F-2	U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements	Date:
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**INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO
RADIATION CONTROL AREAS AND COMPARTMENTS**

A Work Authorization Request (Form F-1) must be submitted and approved prior to entry into any Radiation Control Areas aboard the N/S SAVANNAH. Control Areas are defined as any space, compartment, or area designated as a Radiation Area due to the presence of radioactivity, radiation sources, residual radioactivity, or radioactive contamination in the space or on equipment, in systems, etc. These areas are posted with the appropriate radiation caution signs. Entry into Control Areas should be made with the minimum number of persons required to perform the work or inspection. Time required to perform work or inspections should be as short as possible to prevent unnecessary radiation exposure to personnel.

A. Compartment or space to be entered:

B. Date and time entered:

C. Protective Clothing Shall be worn as follows:

- | | |
|-----------------------------------|----------------------|
| 1. Anti-C Suits (coveralls) | 2. Shoe Covers |
| 3. Gloves | 4. Respirators |
| 5. Hoods (head cover) | 6. |

D. Personnel Dosimeters Shall be worn by each worker: YES_____ NO_____

E, Record of Personnel Exposure Shall be maintained : YES_____ NO_____

(Maintain Personnel Exposure Record on form C-1)

F. Record of Numbered Security Seals:

Number on seal removed: _____ Removed By: _____

Number on seal installed: _____ Installed By: _____

G. Other Information:

G. RADIOACTIVE MATERIAL AND WASTE DISPOSAL

1. Scope

The procedures outlined in this section are formulated to cover radioactive material such as sealed sources, devices, and other radioactive material and waste not contained as corrosion and fission products remaining as residual activity in the nuclear power plant and systems.

2. Radioactive Material

- a). All radioactive material (sealed sources, devices, and calibration sources) have been removed from the vessel and transferred.
- b). The calculated residual radioactivity remaining in the nuclear plant and systems as of April 1976 was is as follows:

Activated components within the Pressure Vessel108,496 Curies
Corrosion and Fission products plated out throughout the system16.6 Curies
Total Calculated Residual Activity.....108,513 Curies

- c). The estimated residual radioactivity remaining in the nuclear plant and systems as of November 2007 is as follows:

Activated components within the Pressure Vessel4,066 Curies
Corrosion and Fission products plated out throughout the system0.3 Curies
Total Calculated Residual Activity.....4,066 Curies

3. Radioactive Waste

- a) All major loose radioactive waste (components and solid waste) have been removed from the ship.
- b) Additional radioactive waste may be generated through the health physics monitoring activities and maintenance or repair to the contaminated components, systems or the characterization efforts.
- c) Solid radioactive waste will be kept in designated drums clearly marked and labeled RADIOACTIVE WASTE and noting contents.
- d) Disposal of solid radioactive waste will be made in accordance with applicable state and federal regulations.

- e) Discharge or disposal of liquid radioactive waste into the river from the vessel is not permitted.
- f) The following records will be maintained:
 - Radioactive Liquid Waste Disposal Log
 - Solid Radioactive Waste Disposal Log

H. RECORDS, LOGS, AND REPORTS

1. Scope

In addition to the records required by applicable regulations, the licensee shall maintain the records as defined in the Technical Specifications for the N/S SAVANNAH. The following are provided for example purposes only. Refer to the Technical Specifications for a complete listing of records:

- a) Health Physics Records
 - Personnel Exposure
 - Area Surveys
 - Sample Collection and Analysis Data
- b) License Event Report (LER) Log
- c) Radioactive Liquid Waste Disposal Log
- d) Solid Radioactive Waste Disposal Log
- e) Records of Review and Audit Committee
- f) File of Annual Reports

2. Annual Report

A written annual report shall be submitted to the U. S. Nuclear Regulatory Commission (NRC) Washington, DC prior to March 1 of each year. The report must include the items defined in the Technical Specifications. The following are provided for example purposes only. Refer to the Technical Specifications for a complete listing of required items:

- a) The status of the vessel.
- b) The results of the semi-annual radiation surveys.
- c) The results of the semi-annual environmental sample analysis surveys.
- d) The results of quarterly intrusion alarm system checks.
- e) The amount of radioactive materials removed from the SAVANNAH by releases, discharges, and shipments of radioactive waste material.
- f) A description of the principal maintenance performed on the vessel.

- g) Any unauthorized entry into radiation control areas by visitors or employees and corrective actions taken to improve access control.
- h) Any degradation of one of the several boundaries which contain the radioactive materials aboard the SAVANNAH.

I. EMERGENCY NOTIFICATION**1. Scope**

Accidents, incidents, or conditions which have or may have potential impact on the radiological safety of the N/S SAVANNAH and/or the surrounding environment come under the scope of this Radiation Protection Manual or in the case of an incident, the SERAT Shipboard Emergency Response and Inspection Protocol. These may include, but are not limited to the following:

- a) a significant increase in the radiation or contamination levels aboard ship
- b) rupture or leakage of one of the radioactive systems or components
- c) excessive water in one of the control areas not due to condensation
- d) fire aboard ship
- e) major flooding of the vessel
- f) ramming of the vessel
- g) personnel overexposure

2. Reporting of Emergencies

The licensee shall immediately contact and notify the Radiation Safety Officer or a member of his health physics staff of a radiological emergency.

The RSO or HP will respond to make a determination if the condition is safety related and will perform an investigation and prepare a report on the findings.

Current Technical Specifications require a Health Physicist will be on call 24-hours a day and will be able to respond within 2 hours to provide health physics support for radiological emergencies or for entry into radiation control areas.

3. Licensee Event Report

Requirements and formal guidance for Licensee Event Reports (LERs) are provided in the Technical Specifications for the N/S SAVANNAH. The following information concerning LERs is for informational purposes.

LERs shall be made to the U.S. Nuclear Regulatory Commission Operations Center by telephone within 24 hours of a reportable event. Reportable events are as follows:

- a) The entrance of an unauthorized person or persons into the radiation control areas.
- b) A significant change in the radiation or contamination levels in the vessel.
- c) Any release of radioactive material to the environment in excess of 10% of concentration limits of 10 CFR Part 20, Appendix B, Table II.
- d) Any major damage to the vessel due to severe weather conditions or other causes.
- e) Major flooding or sinking of the vessel.
(Major flooding is defined as one major ship compartment. The SAVANNAH is designed to remain afloat with two major compartments flooded.)

In addition to the LER transmitted to the Nuclear Regulatory Commission within 24 hours by telephone, telecopy, or telegraph, the NRC must receive a written report within two weeks.

U. S. NUCLEAR REGULATORY COMMISSION
Operational Center (Primary Point of Contact)
(301) 816-5100

U. S. NUCLEAR REGULATORY COMMISSION
Region II – Atlanta Office (Secondary Point of Contact)
(404) 562-4400

U. S. NUCLEAR REGULATORY COMMISSION
White Flint - Headquarters (Alexander Adams Jr. Courtesy Call)
(301) 415-1127

Form I-1 – Licensee Event Report (typical)

Form I-1	U.S. MARITIME ADMINISTRATION N/S SAVANNAH Licensee Event Report	Date:
TO:	FACILITY: Nuclear Ship SAVANNAH LOCATION: DOCKET No: 50-238 LICENSE NO: NS-1	
FROM:		
EVENT DESCRIPTION AND PROBABLE CONSEQUENCES:		
RADIOACTIVITY RELEASED:		
PERSONNEL EXPOSED: PERSONNEL INJURED		
NRC OPERATIONS CENTER NOTIFIED _____ AT _____ BY _____ date time name		
MESSAGE TAKEN AT NRC BY: _____ AT _____ name of individual phone number		
Signed: _____ Date: _____ Phone _____		

EMERGENCY NOTIFICATION LIST**HEALTH PHYSICIST – ON CALL**

Erik Abkemeier

Thomas Jefferson National Accelerator Facility

Phone (757) 269-7551

Mobile (757) 876-5342

RADIATION SAFETY OFFICER

John Davis

General Health Physics, Inc.

Phone (703) 550-7525

Phone (800) 247-6572

MARITIME ADMINISTRATION

Erhard Koehler

Senior Technical Advisor, N/S SAVANNAH

Phone (Office) (202) 366-2631

Mobile Phone (202) 309-4610

Home Phone (410) 452-8749

MARAD SOUTH ATLANTIC REGION

Jeff McMahon

Ship Operations and Maintenance Officer

Phone (Office) (757) 441-3136

Mobile Phone (757) 287-8471

Home Phone (410) 467-7108

VIRGINIA. DEPT. HEALTH & ENVIRONMENTAL CONTROL

Phone (Monday-Friday 8:15 a.m. – 5:00 p.m.) (757) 518-2000

Phone (all other times) (804) 674-2400

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(301) 415-1127

U. S. COAST GUARD – HAMPTON ROADS

Phone (757) 668-5570

Phone (757) 668-5571